

What is claimed is:

1. A vehicular generator-motor system comprising:

5 a rotary machine including a stator having three phase armature winding and a rotor composed of a field winding for magnetizing a plurality of field magnetic poles and permanent magnets for magnetizing said field magnetic poles by interaction with the field winding;

10 an electrical power converter which performs as a rectifier when said rotary machine is operated as a generator, and performs as an inverter when said rotary machine is operated as a motor; and

15 a control means for controlling said electrical power converter, thereby, when said rotary machine is operated as a motor, said control means controls said electrical power converter so as to restrict the armature current at the time of low speed rotation.

2. A vehicular generator-motor system according to claim 1, further comprising:

20 a field current control means for controlling a field current flowing through the field winding, wherein when said rotary machine is operated as a motor, said field current control means is controlled by said control means to increase said field current at the time of low speed rotation.

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3. A vehicular generator-motor system according to claim 2, wherein said field current control means is controlled by said control means to reduce said field current with increasing rotating speed of said rotary machine.

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4. A vehicular generator-motor system according to claim 1,  
wherein when said rotary machine is operated as a starting  
motor, said control means controls three phase terminal voltage  
of said inverter in response to the rotating speed of said  
5 rotary machine.

5. A vehicular generator-motor system according to claim 2,  
wherein when said rotary machine is operated as a starting  
motor, said control means controls three phase terminal voltage  
10 of said inverter in response to the rotating speed of said  
rotary machine.

6. A vehicular generator-motor system according to claim 3,  
wherein when said rotary machine is operated as a starting  
motor, said control means controls three phase terminal voltage  
15 of said inverter in response to the rotating speed of said  
rotary machine.

7. A vehicular generator-motor system according to claim 1,  
wherein the armature current at the time of low speed rotation  
is limited to 300 amperes or below.  
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8. A vehicular generator-motor system according to claim 1,  
wherein said electrical power converter operated as the  
inverter is air-cooled.

25 9. A vehicular generator-motor system according to claim 1,  
wherein said electrical power converter is functioned as the  
inverter only when said rotary machine is operated as a motor.

10. A vehicular generator-motor system according to claim 1,  
30 wherein said rotor includes a pair of claw-shaped poles in

which each of pair poles has a plurality of claw-shaped pole pieces alternately meshed to each other, and each of said permanent magnets is inserted between said adjacent claw-shaped pole pieces.

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11. A vehicular generator-motor system according to claim 10, wherein each of said adjacent claw-shaped pole pieces is magnetically shorted by a magnetic bridge element at the periphery of said claw-shaped poles, and said permanent magnets are disposed inside of said bridge elements.

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